

### REMARKS

Applicant requests favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Applicant notes with appreciation that the Examiner has returned an initialed copy of the PTO-1449 form, which was submitted with the Information Disclosure Statement filed on January 7, 2002. In reviewing that paper, however, Applicant further notes that the Examiner has not yet indicated his consideration of Japanese patent document no. 10-163547, which was cited in that disclosure statement. Accordingly, Applicant requests that the Examiner initial and return another copy of that PTO-1449 form, indicating his consideration of the noted document. Favorable consideration is requested.

The specification has been amended to place the subject application in better form. A new abstract has also been presented in accordance with preferred practice. No new matter has been added by these changes.

Claims 1-15 are presented for consideration. Claim 1 is the sole independent claim. Claim 5 has been canceled without prejudice or disclaimer. Claims 1, 7, 8 and 10 have been amended to clarify features of the invention, while claims 14 and 15 have been added to recite additional features of the subject invention. Support for these changes and claims can be found in the application, as filed. Therefore, no new matter has been added.

Applicant requests favorable reconsideration and withdrawal of the objection and rejections set forth in the above-noted Office Action.

Claim 5 was objected to due to a minor informality. This informality has been corrected in this response, in which the subject matter of claim 5 also has been substantively incorporated in independent claim 1. Applicant submits that these changes overcome this objection. Such favorable indication is requested.

Claims 8 and 10 were rejected under 35 U.S.C. § 112, first paragraph. The Examiner asserted that the subject disclosure does not provide adequate support for an optical system operable to transform laser light into incoherent light. Applicant submits that the subject matter noted by the Examiner is, in fact, supported by the original disclosure. Therefore, this rejection is respectfully traversed. In this regard, the specific structure for the "optical system" is supported by the description on page 4, at line 15, to page 5, at line 4, as well as on page 10, at line 22, to page 11, at line 1, with respect to the discussion of the incoherency transforming unit 2 shown, for example, in Figures 1, 3 and 8 of the drawings. Accordingly, Applicant requests favorable reconsideration and withdrawal of this rejection.

Turning now to the art rejections, claims 1-6 and 11-13 were rejected under various statutory bases as being unpatentable over U.S. Patent No. 5,789,734 to Torigoe et al. Claim 7 was rejected under 35 U.S.C. § 103 as being unpatentable over the Torigoe et al. patent in view of U.S. Patent No. 6,256,087 to Bader. Claim 9 was rejected under 35 U.S.C. § 103 as being unpatentable over the Torigoe et al. patent and further in view of U.S. Patent No. 5,552,892 to Nagayama. Applicant submits that the cited art, whether taken individually or in combination, does not teach many features of the present invention as previously recited in independent claim 1. Therefore these rejections are respectfully traversed. Nevertheless, Applicant submits that

independent claim 1, as presented, amplifies the distinctions between the present invention and the cited art.

Independent claim 1 recites an exposure apparatus that includes an illumination optical system for illuminating a pattern of a reticle with laser light outputted from a continuous emission laser, a projection optical system for projecting the illuminated pattern onto a subject to be exposed and an interferometer, of a Fizeau type, being operable while using laser light outputted from the continuous emission laser.

Generally speaking, a Fizeau type interferometer, as used in the subject invention, has a simple structure and yet a precision that is higher as compared to that of other interferometers such as a Twyman-Green interferometer or a Mach-Zehnder interferometer. A Fizeau type interferometer, however, needs a light source having a long coherence length.

Still, generally speaking, lasers currently and widely used in exposure apparatus as light sources are typically pulse emission lasers. The coherence length of such a laser, however, is short. Therefore, such lasers cannot be suitably used as a light source for a Fizeau type interferometer.

The inventor of the subject invention has found that a continuous laser has a long coherence length such that it can be used both as a light source for an exposure apparatus and as a light source for an interferometer of a Fizeau type.

Accordingly, the present invention provides the ability to accurately measure aberration of a projection optical system used with a light source for producing exposure light, with a

simple structure and yet a higher precision. Such features are discussed in more detail in the subject specification on page 6, for example.

Applicant submits that the cited art does not teach or suggest such features of the present invention, as recited in independent claim 1.

The Torigoe et al. patent shows the use of an interferometer such as a Twyman-Green type for measuring spherical aberration of a projection optical system. That patent also refers to the use of a common light source for an exposure apparatus and the interferometer. In Applicant's view, however, the exposure light source used in the device in the Torigoe et al. patent for providing the exposure light appears to be an ordinary excimer laser. Thus, that patent teaches nothing regarding the use of a continuous emission laser nor the use of a Fizeau interferometer in conjunction with such a continuous emission laser, in the manner present invention recited in independent claim 1.

For the reasons noted above, Applicant submits that the Torigoe et al. patent does not teach or suggest the salient features of Applicant's present invention as recited in independent claim 1, such as a common light source of a continuous emission laser, which is used both for an exposure apparatus and for a Fizeau type interferometer.

Applicant further submits that the remaining art cited does not cure the deficiencies noted above with respect to the Torigoe et al. patent. The Examiner relies on the Bader patent for showing the use of a semi-transparent mirror to guide light from an illumination system of an exposure apparatus, and the Nagayama patent for showing the use of an actuated mirror to guide light from an illumination system of an exposure apparatus away from the exposure function.

Applicant submits, however, that neither of these patents teaches or suggests at least the arrangement of the illumination optical system for illuminating a pattern of a reticle with laser light outputted from a continuous emission laser and an interferometer, of a Fizeau type, being operable while using laser light outputted from the continuous emission laser, in the manner of the present invention recited in independent claim 1. Therefore, those patents add nothing to the teachings of the Torigoe et al. patent that would render obvious Applicant's present invention recited in that claim.

For the foregoing reasons, Applicant submits that the present invention, as recited in independent claim 1, is patentably defined over the cited art, whether that art is taken individually or in combination.

The dependent claims also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in independent claim 1. Further individual consideration of these dependent claims is requested.

Applicant further submits that the instant application is in condition for allowance. Favorable reconsideration, withdrawal of the objection and rejections set forth in the above-noted Office Action and an early Notice of Allowance are requested.

Applicant's undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Steven E. Warner", is written over a horizontal line.

Attorney for Applicant  
Steven E. Warner  
Registration No. 33,326

FITZPATRICK, CELLA, HARPER & SCINTO  
30 Rockefeller Plaza  
New York, New York 10112-3801  
Facsimile: (212) 218-2200

SEW/eab

DC\_MAIN 123065 v 1